OBSERVATIONS
ON THE
Structure of the Inteſtinal Worms
OF THE
HUMAN BODY:

BEING
AN ATTEMPT
TO ARRANGE THEM IN
CLASSES, GENERA, AND SPECIES.

WHEREIN IS GIVEN
A PARTICULAR ACCOUNT
OF THE
TRICHURIS.

WHICH OBTAINED THE MEDICAL SOCIETY'S
PRIZE-MEDAL, 1798.

By *R. HOOPER,* M. D. F. L. S. &c.

1799.

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OBSERVATIONS

ON

HUMAN INTESTINAL WORMS, &c.

It is a fact equally well known to phyſicians and philoſophers, that the human body contains in its interior, different ſpecies of worms. Theſe worms are alſo known to produce diſeaſed ſtates of the bodies in which they inhabit, and to become the ſource of innumerable evils. To inquire therefore into their anatomy and economy, and to point out their peculiarities, is a matter of no ſmall importance, but, on the contrary, may contribute to eſtabliſh a more rational method of cure in diſeaſes produced by theſe worms. The deſcriptions of writers on this ſubject are frequently diſcordant, and we have yet

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to lament the want of an arrangement, which ſhall diſtinctly point out the ſpecific characters by which each worm may be diſtinguiſhed. To obviate theſe inconveniences, and to reduce to order what has hitherto been much confuſed, I have, in the following ſheets, endeavoured to lay down ſome obſervations towards eſtabliſhing an arrangement of human inteſtinal worms. It is my intention alſo, at ſome future period, to prove, that the human inteſtinal worms are of themſelves diſtinct from all other worms, and only inhabit and propagate in the human *primæ viæ*.

The motives, which induced me particularly to conſider this ſubject were, the very frequent applications made to me by the numerous and indigent poor who applied to the inſtitution to which I have the honour to belong, for relief in diſeaſes produced by theſe animals. At this place, ſacred to the feelings of humanity, I have enjoyed every advantage that the extenſive nature of my ſituation would permit. To this object my views have been directed for theſe eight years. In all the caſes which have come under my care, and in all the diſſections at which I have been preſent, whether of the human ſpecies, or of other animals, I have been uniformly deſirous of inveſtigating the nature of worms.

At ſome future period, ſhould time and opportunity permit, I purpoſe laying before the public ſome obſervations on the different methods of cure in worm diſeaſes, to which the preſent paper is preparatory; but, in conſequence of being at preſent engaged in ſeveral literary undertakings, I am apprehenſive it may be ſome time before I can arrange my papers and notes on this important branch of pathology.

It is now five years ſince I firſt diſcovered a new ſpecies of worm, the drawing of which, as well as of the other worms, was made by that ingenious artiſt Mr. Henry de Bruyn, by whoſe unremitting attention I am enabled to lay before the ſociety the ſeveral drawings, the greateſt part of which were taken from the microſcope; but it was not till lately that I found that the ſame worm was firſt mentioned by Roederer, in the year 1760. To him the honour of the diſcovery is therefore due, "*longe mihi potior cura eſt veritatis quam novitatis*," (Morgagni). By him it was firſt called Trichuris, and under that name I have deſcribed it.

It is ſomewhat ſingular, that this worm ſhould have eſcaped the notice of anatomiſts and phyſicians ſo long; and, although it is mentioned of late years by Wriſberg, Blumenbach, Goeze, and others, their deſcriptions will be found to vary conſiderably from that which I have given. I believe it to be entirely new in this country. It is nowhere mentioned in the works of any of our moſt celebrated anatomiſts and phyſicians, nor do the moſt eminent characters, with whom I have had frequent opportunities of mentioning this ſubject, ever recollect to have met with it in their practice; on which account it may, with propriety, be numbered among the diſcoveries of modern times. There are ſeveral ſpecimens of this worm in the late Dr. Hunter's muſeum, but this great anatomiſt, engaged in purſuits which have immortalized his name, was ignorant of their being Trichurides, and believed them to be adventitious. By Dr. Baillie's kindneſs I have examined them, and find them, in every reſpect, ſimilar to that which I have deſcribed.

The following obſervations are intended to point out the principal *phenomena* obſervable in theſe paraſitical animals, as far as they are with certainty known. A great field remains yet to be explored, and, perhaps, at ſome future period, their nature and offices may be more generally and better known: "*nam multum egerunt qui ante nos fuerunt, ſed non peregerunt; multum adhuc reſtat operæ, multumque reſtabit: neque ulli nato poſt mille ſecula præcidetur occaſio aliquid adhuc adjiciendi.*"—Seneca.

Such is the nature and office of the human ſtomach and inteſtines, that inſects and worms, or their ovula, may not unfrequently be conveyed into that canal with thoſe things, that are continually taken as food; but ſuch inſects or worms do not live long, and ſeldom, if ever, generate in a ſituation ſo widely different from their natural one.

Beſides theſe, there are worms, that are never found in any other ſituation than the human ſtomach or inteſtines, and which there generate and produce their ſpecies.

Thus it appears that the human ſtomach and inteſtines are the ſeat for animalculæ, which are tranſlated from their natural ſituation, and alſo for worms proper to them, which live in no other ſituation, as I ſhall prove in the deſcription of each ſpecies.

THE FIRST CLASS

Contains thoſe worms, which are generated and nouriſhed in the human inteſtinal canal, and which there propagate their ſpecies.

THE SECOND CLASS

Comprehends thoſe inſects or worms, that accidentally enter the human primæ viæ *ab extra*, and which never propagate their ſpecies in that canal, but are ſoon eliminated from the body; ſuch are, ſeveral ſpecies of Scarabœi, the Lumbricus terreſtris, the Faſciola, the Gordius inteſtinalis, and others.

The ſecond claſs belongs to the province of natural hiſtory. The conſideration of the firſt claſs is the ſubject of the preſent paper, which, from the variety it affords, I have thought proper to divide into different orders, genera, and ſpecies, and have attached ſuch peculiarities as, eventually, will diſtinguiſh them from all others.

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ORDER I.

THE ROUND WORMS.

GENUS I.

INTESTINAL ASCARIDES.

Character.

Body round. Head obtuſe and furniſhed with three veſicles.

Species.

ASCARIS LUMBRICOIDES. THE LONG ROUND WORM, OR LUMBRICOID ASCARIS.

Character.

When full grown, a foot in length. Mouth triangular.

ASCARIS VERMICULARIS. THE THREAD OR MAW WORM.

Character.

When full grown, half an inch in length. Tail terminates in a fine point.

GENUS

GENUS II.

INTESTINAL TRICHURIDES.

Character.

Body round. Tail three times the length of the body. Head without veſicles.

Species.

TRICHURIS VULGARIS. THE TRICHURIS, OR LONG THREAD WORM.

Character.

The head furniſhed with a proboſcis.

ORDER II.

THE FLAT WORMS.

GENUS I.

INTESTINAL TAPE WORMS.

Character.

Body flat and jointed.

Species.

TÆNIA OSCULIS MARGINALIBUS. THE LONG TAPE WORM.

Character.

The oſcula are ſituated upon the margin of the joints.

TÆNIA OSCULIS SUPERFICIALIBUS. THE BROAD TAPE WORM.

Character.

The oſcula are placed upon the flattened ſurface.

Theſe worms were all known to the ancients, the Trichuris only excepted, and are mentioned in the works of Hippocrates, Galen, Celſus, Paulus Ægineta, and Pliny.

ORDER I.

GENUS I.

Species I.

ASCARIS LUMBRICOIDES.

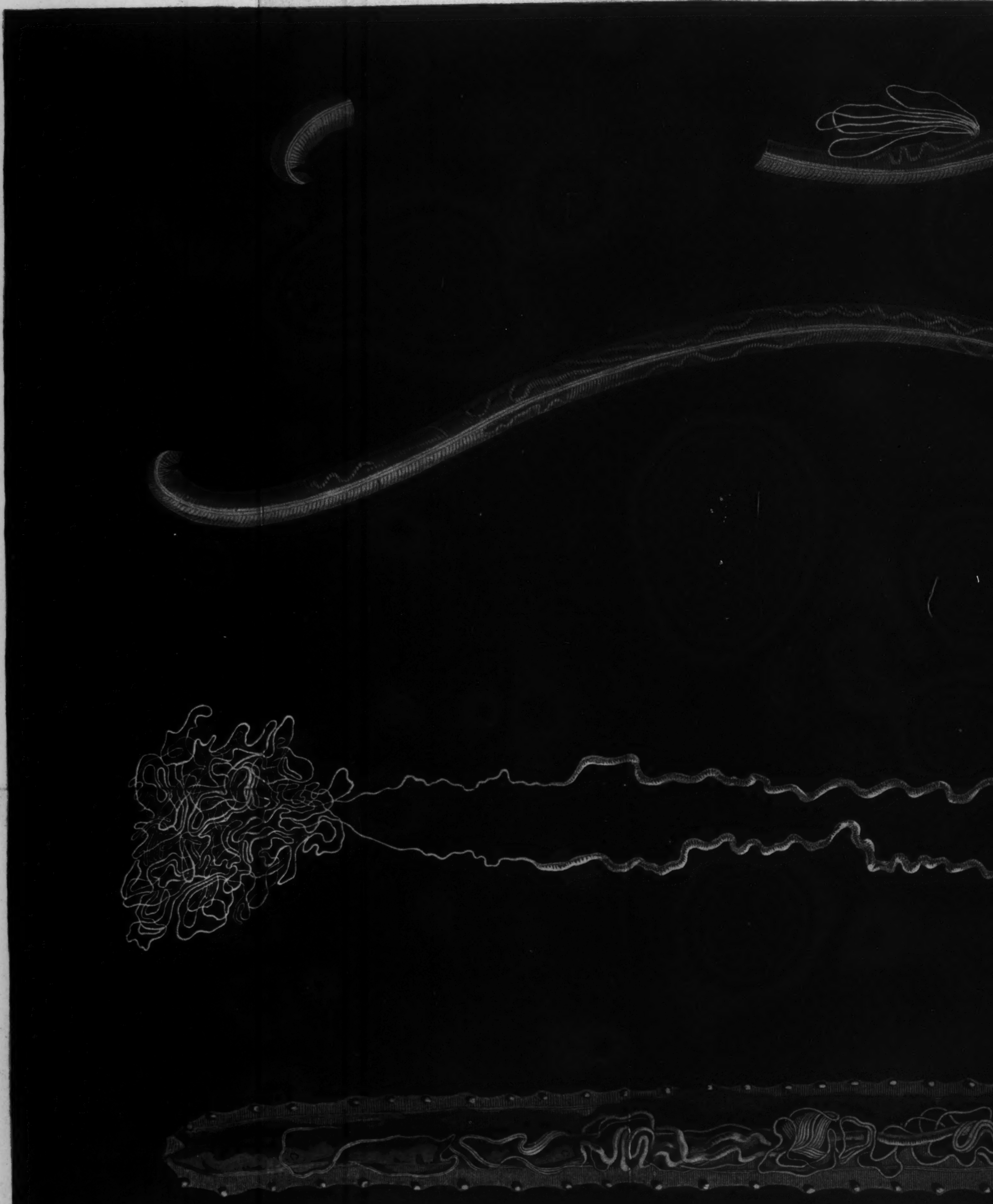
Latin. Lumbricus teres.
Engliſh. The long round worm.
French. Le ver ſtrongle, le ver long et rond.
Ελμινς στρογγυλα of the *Greeks.*

SYNONYMS.

Lumbricus teres. *Clerk hiſtor. lumb. lator. p.* 229.
——— inteſtinalis humanus teres. *Klein. herpet. p.* 62.
——— inteſtinalis. *Pallas diſſert. de infr. vivent. p.* 13. *n.* 4.
Aſcaris lumbricoides. *Linnei ſyſtem. natur. p.* 1076.
————— *Mulleri hiſtor. vermium. p.* 35. *n.* 166.
Der Darmwurm. *Mulleri tranſl. Linnei ſyſt. nat. vol.* vi. *p.* 36.
Der Hurzwurm. *Zwingeri obſervat. p.* 437.
Der Rundwurm. *Goeze. Naturgeſch. p.* 78.
Der Spulwurm. *Bloch.* Abhandlung vou der Crzengung, &c. &c.

Eſſential

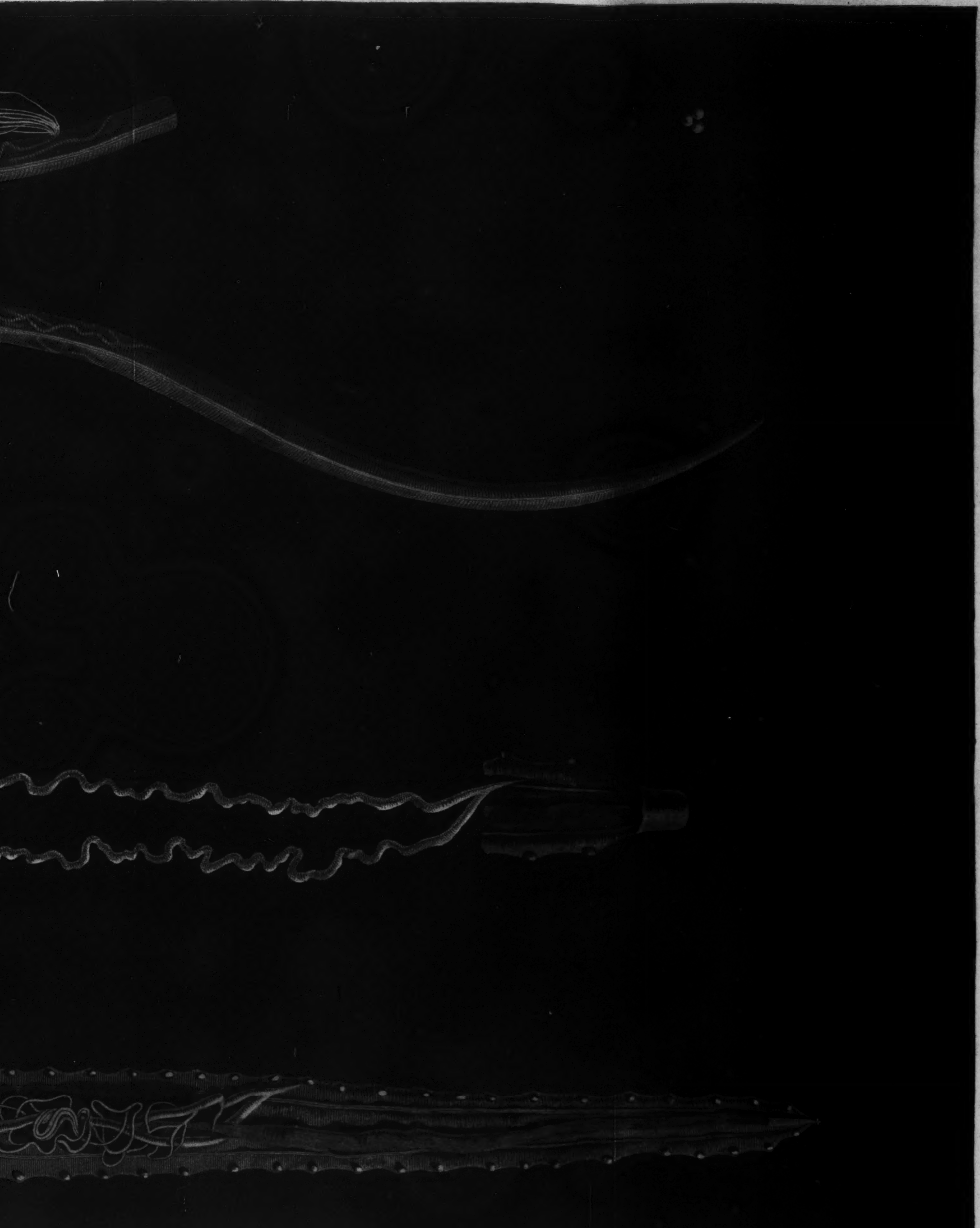
m; it puts on a rugoſe appearance, and
has



H. De Bruyn Delt.

Ascaris Lum

Published Dec.r 1, 1798. by J. Johnson, S



T. Medland Aquatinta

Lumbricoides.

Johnson, St. Pauls Church Yard, London.

Eſſential Character.

The body round. Length from twelve to fifteen inches. Head furniſhed with three veſicles, forming in their middle a triangular ſpace.

Deſcription.

Size. When full grown, from twelve to fifteen inches in length; and in circumference equal to that of a gooſe quill.

The head is to be diſtinguiſhed from the tail by a ſmall contraction, very obvious when the worm is lying down; it is trilobated, having three veſicles, and a triangular aperture, between which is the mouth. Theſe three globoſe papillæ are joined together at their baſis, and are of the ſame colour as the reſt of the worm.

The tail may be known from the head by its very acute termination, cloſe to which is a large orifice, the extremity of the inteſtinal canal, which I have therefore termed the anus.

The body is that part between the two extremities, forming nearly the whole of the worm; it puts on a rugoſe appearance, and has a line very apparent running on each ſide, and extending from one end to the other. Between theſe two lines are two other lines running parallel with the former, ſcarcely viſible. Near the middle of the body (rather towards the head) is a circular depreſſion of about the one-fourth of an inch in extent, in which is a very ſmall punctiform aperture. This depreſſed band is regular in its appearance, when the body of the worm is diſtended, although it would appear to be wanting when collapſed, in which ſtate it moſtly eſcapes from the inteſtines.

Situation.

They generally infeſt the ſmall inteſtines, and of theſe more frequently the courſe of the jejunum and ileum. Sometimes they are known to aſcend through the duodenum into the ſtomach, and I have frequently ſeen them creep out at the mouth and noſtrils. It happens but rarely, that they deſcend into the tract of the large inteſtines, and then only after the exhibition of vermifuges, or from other cauſes, which increaſe the periſtaltic motion. They have alſo been detected *poſt mortem* in the ductus communis cholidochus;

and inſtances are related where they have remained a conſiderable time in the veſica fellis *.

Number.

In general they are very numerous; I knew a girl eight years old who voided *per anum* upwards of two hundred in the courſe of a week; between thirty and fifty is a very common number. Neverthleſs inſtances frequently occur of their being ſolitary.

Colour.

When recently excluded they are tranſparent, and appear as if they had been ſucking water tinged with blood; this colour, however, ſoon diſappears, and they become at length of a light and opaque yellow.

Motion.

When voided by patients they are, in general, very feeble, and ſoon die in ſpite of all attempts to keep them alive. I have, however, occaſionally ſucceeded by ſuddenly evacuating them by a very draſtric purge, and immediately putting them into warm milk and water, when they appear extremely vivacious. Their motion is ſerpentine, and in no reſpect reſembles that of the lumbricus terreſtris, or earth worm, which has the power of conſiderably diminiſhing its length and again extending itſelf. Whereas that of the lumbricoid aſcaris is never diminiſhed, the head is always ſent forward by the worm curling itſelf into circles, and ſuddenly extending it with conſiderable force to ſome diſtance.

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* There is a preparation illuſtrative of this fact in the Muſeum of Mr. Heaviſide. The greateſt part of the worm is convoluted within the gall-bladder, and a portion of the tail fills the *ductus cyſticus.*

Sex.

It is ſaid that the aſcaris lumbricoides is not hermaphrodite, but that the male and female are diſtinct worms *. The worm which I have deſcribed is conſidered as the female, and all the obſervations I have given are made from one of that ſex. Nevertheleſs, I muſt obſerve, that I have examined a very conſiderable number of theſe animals, and have never ſeen any other appearances than thoſe I have deſcribed.

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* This is the opinion of many ingenious anatomiſts, and Dr. Baillie, in his *Morbid Anatomy*, page 122, ſays, " in the lumbricus teres the parts of generation are different in the male and female."

Anatomical Obſervations.

Cuticle. The covering or external membrane of the worm which may be conſidered as the cuticle, is very ſtrong, elaſtic, thin, ſmooth, and tranſparent; and eaſily ſeparates from the parts beneath if the worm be macerated a few days after death in water.

Cutis. Under the cuticle lies the cutis, or true ſkin, which is conſiderably thicker than the former, and retains the marks of the muſcles which it covers. It is alſo very ſtrong, elaſtic, and tranſparent.

Muscles. When the cutis is removed the muſcles, obſervable through the ſkin of the worm, preſent themſelves. They do not entirely ſurround the worm, as from their appearance one would be induced to believe; but are, in fact, two diſtinct orders acting in oppoſition to each other; for the two longitudinal lines, which extend from one extremity of the worm to the other, are, each of them, compoſed of two diſtinct tendons, ſeparable from one another. Theſe tendons ſerve for the attachment of the ſemilunar muſcles, which cover the worm from the head to the tail.

Mucous Vesicles. Upon removing carefully the ſemilunar muſcles from the head to the depreſſed band, a number of minute veſicles are to be ſeen (by means of a glaſs) filled with a ſubmucous fluid, which iſſues out upon puncturing them. This cellular, or parenchymatous apparatus, cloſely embraces the inteſtinal tube, from the head to the depreſſed band; but from thence to the tail, there is merely a fibrous connecting ſubſtance, ſimilar to what is generally called cellular membrane.

Peritoneum. When the muſcles are removed from the depreſſed band to the tail of the worm, an extremely delicate membrane preſents itſelf, analogous to the peritoneum, for it embraces the abdominal viſcera, and lines the cavity of the abdomen.

Cavity of the Abdomen. This extends from the depreſſed band near the middle of the worm to the tail; it is moſtly diſtended with a tranſparent fluid, and contains the inteſtinal tube and an apparatus ſuppoſed to be ſubſervient to generation, which conſtitute the abdominal viſcera.

Intestinal Canal. This begins at the obtuſe extremity or head, from the external triangular mouth ſituated between the three globoſe papillæ, and is continued for a ſmall ſpace downwards (nearly half an inch) in a parallel form. To this part Dr. Baillie, in his Morbid Anatomy, has given the name of œſophagus. It then becomes larger and tranſparent, continues increaſing in ſize as it advances, until it arrives at the beginning of the abdomen, in which courſe it is cloſely embraced by a parenchymatous ſubſtance, as I have before noticed. Having now attained the ſize of a crow quill, it paſſes in a ſtraight direction (and gradually enlarges as it advances), through the whole length of the worm, to within the eighth part of an inch, where it becomes ſuddenly narrower, and terminates in the anus.

This canal is generally filled with a greeniſh coloured fluid of the conſiſtence of mucus, not very unlike to the *meconium* of infants. If a portion of this tube be macerated for a few days in water, it exhibits diſtinct tunics, the external of which is a production of the peritoneum; it is externally covered with filaments, which connect it to the abdominal parietes. May not theſe be veſſels of nutrition?

THE

THE SECOND VISCUS. This apparatus is conſidered by ſome as peculiar only to the female worm *, but all agree, that it is for the purpoſe of generation. It begins near the middle of the worm, where the cavity of the abdomen commences, by a ſlender tube, which is continued from the punctiform aperture, ſituated in the depreſſed band between the two longitudinal lines. This tube, which is termed the vagina, ſoon becomes much larger, when it commences uterus, and divaricates into two large crura, which, for the ſpace of four or five inches, are continued of an uniform diameter; they, then, on a ſudden, become much diminiſhed in ſize, and appear like opaque threads, embracing in every direction the inteſtinal tube. Theſe are by *Werner* conſidered as the Fallopian tubes.

This convoluted apparatus is compoſed of very fine tranſparent membranes. It is never found empty, but is always diſtended with an opaque fluid, in which are a number of globular bodies, or ovula, containing young worms.

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* In fœminis incipit tubo infundibuliformi, qui poſtice divaricatur in duo ampla crura, &c. &c. In maribus canalis generationi inſerviens, præeunte *Tyſon*, quem *Murray* et *Werner* ſecuti ſunt, hanc ſervat rationem: a poſtico extremo lumbrici incipit canalis conicus aliquot lineas longus, quem *Tyſon* penem appellavit. Vide *Schroeteri* Diſſ. Inaug. p. 13.

Refutation of this Worm being viviparous.

In the ſecond volume of the Memoirs of the Society, to which I have the honour to preſent theſe obſervations, there is an account of the lumbricoid aſcaris, accompanied with a drawing illuſtrative of the worm in the act of voiding her young; the author of which endeavours to prove, that they are viviparous *.

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* "Every one," ſays Mr. Church, "who has examined "this worm attentively, when newly diſcharged from the "body, muſt have obſerved an appearance of white threads, "folded, as it were together, about the middle of the "worm; this ſubſtance has been generally ſuppoſed to be "the inteſtines of the worm filled with the chyle it had "juſt ſucked from the body out of which it proceeded; but "the fact I am going to relate ſeems to prove, beyond a "doubt, that this white appearance is, in reality, the "young worms nearly fit for excluſion from their parent." And in another part he continues, "I put them (the lumbricoid aſcarides) into a phial filled with one-third part of "rectified ſpirit and two-thirds water. This appeared to "give them great uneaſineſs, and whilſt I was obſerving "their contorſions, I perceived ſomething like threads "proceeding gradually from the middle of the belly of one "of them, which advanced very ſenſibly for about a quar-

The account Mr. Church has given, appears to have ariſen, from his not having attended to the internal ſtructure of the animal, for the thread-like appearances, which he has taken to be *in reality the young worms*, are no more than portions of the gyrated apparatus, or Fallopian tubes, I have already deſcribed; which always protrude, when the ſkin of the worm is broken, and this generally happens after any increaſed periſtaltic motion of the inteſtines. But the moſt convincing proof of theſe animals being oviparous is, the detection of ovula in the mucus ſurrounding them in the inteſtines, which do not differ, in any reſpect, from thoſe in the uterus of the worm.

Refutation of this Worm being (as is by many ſuppoſed) the Earth or Lob-worm, Lumbricus terreſtris Linnæi.

The long round worm of the human inteſtines has, for many centuries, been conſidered of

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" ter of a minute; at which time I could perceive three " diſtinct worms, above an inch long, exactly like the parent, all alive and moving briſkly in different directions. " About this time the death of the mother put a ſtop to the " perfect excluſion of the offspring, who alſo died with her, " and now remain hanging to the body."

of the ſame ſpecies as the earth or lob-worm; the fallacy of which I have therefore thought proper to demonſtrate.

The lumbricus terreſtris has but *one veſicle* at its head, in the middle of which is its mouth; it is flat towards the tail, and is furniſhed with ſharp briſtles on its under ſurface, that ſerve it for feet, which the animal can erect or depreſs at pleaſure; its annular muſcles are very large and ſtrongly marked, and its colour is of a duſky red. Whereas the lumbricoid aſcaris has none of theſe *phænomena*. I have before noticed its colour is a pale yellow, that its muſcles are very delicate, and its head furniſhed with *three veſicles*. Upon the under ſurface of the earth-worm there is a large ſemilunar fold in the ſkin, into which the animal can draw its head, or thruſt it out at will; but there is no ſuch form in the aſcaris lumbricoides: the former alſo has an elevated belt in its middle, but in the latter there is a depreſſed band. On each ſide of the aſcaris lumbricoides there is a longitudinal line very diſtinctly marked; on the earth-worm there are three lines upon its upper ſurface.

Species 2.

ASCARIS VERMICULARIS.

Engliſh. The Maw or Thread-worm.
Latin. Aſcaris.
French. L'Aſcaride.
German. **Der Afterwurm.**

SYNONYMS.

Ασκαριδες *of the Greeks.*
Aſcaris pollicaris. *Linnæi Faun. Suec. n.* 1269.
——— vermicularis. ——*Syſt. natur. p.* 1076.
——— cauda ſedacea. *Mulleri hiſt. verm. n.* 165.
——— græcorum. *Pallas diſſert. de infr. vivent. p.* 12.
Vermis aſcaris. *Le Clerc hiſtor. lumb. lat. fig.* 3 *.p.* 10.
Die Aftermade. *Mulleri Syſt. de Lin. vol.* vi. *p.* 53.
Die Afterwurm. *Bloch's Abhandlung von der Crzeugung der Cingeweidewurmer. p.* 81.
Die Pfriemanſchwanz. *Goeze Naturgeſchichte der Cingeweidewurmer. p.* 97.

Eſſential Character.

Head obtuſe, and furniſhed with three veſicles. Tail terminates in a ſharp point.

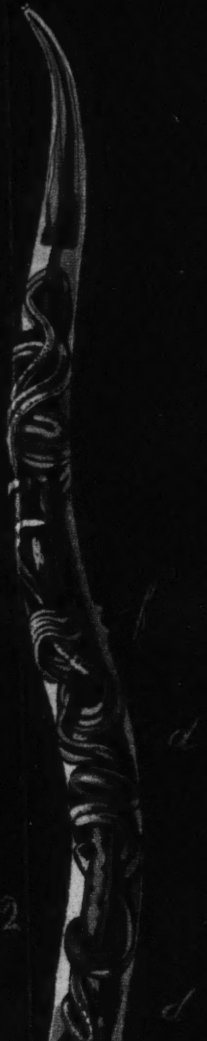


Fig 2

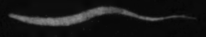


Fig 1

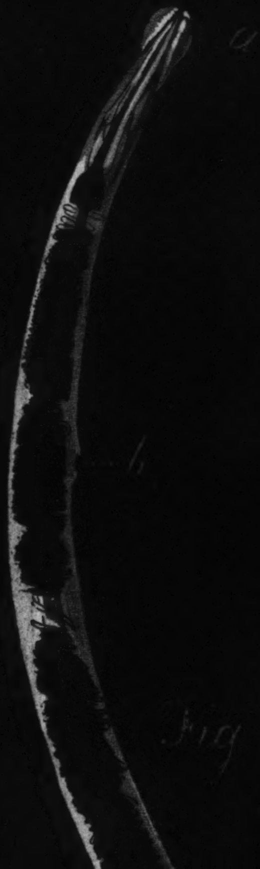
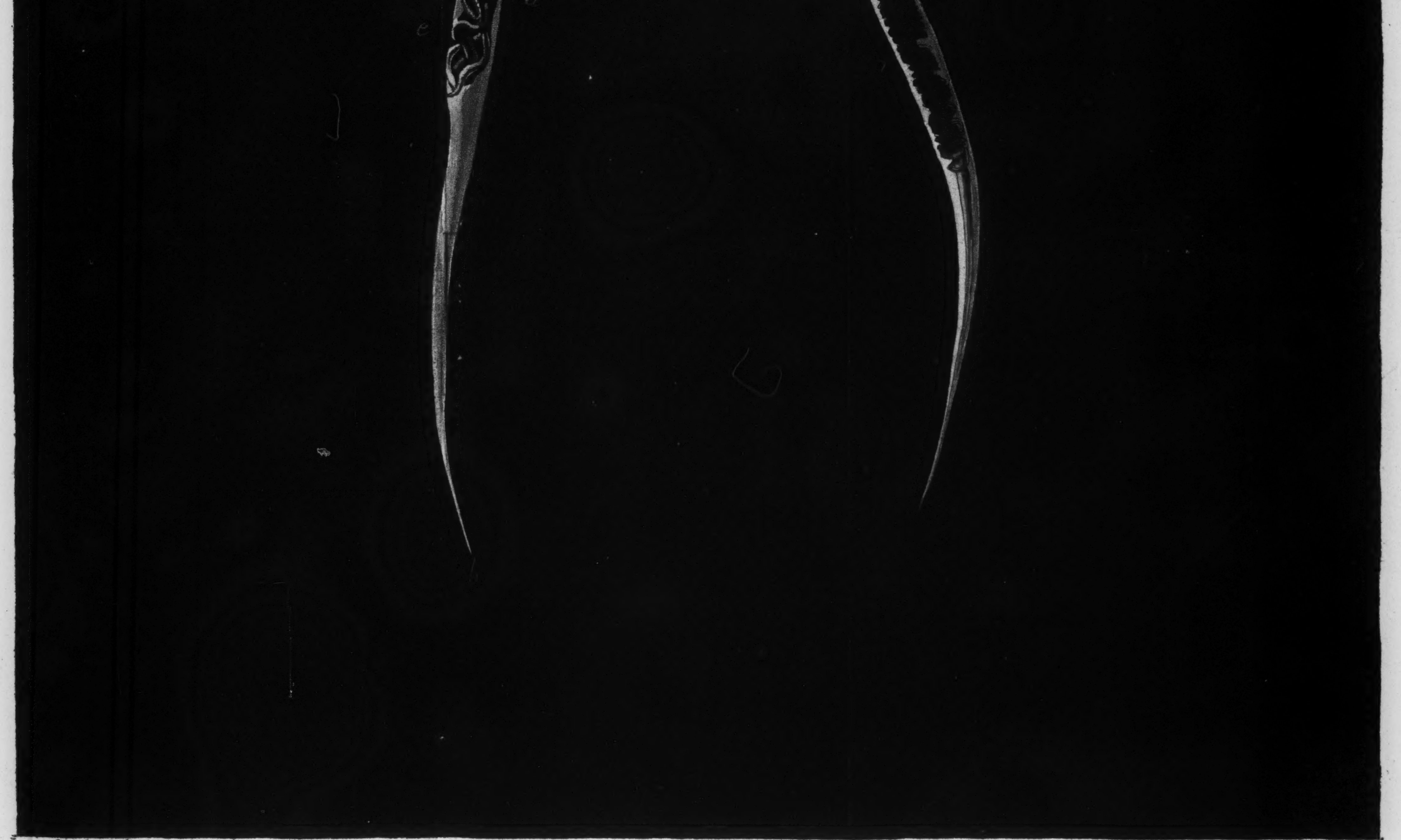


Fig 3



H. De Bruyn Delt. T. Medland Aquatinta.

Ascaris Vermicularis.

Published Decr 1. 1799. by J. Johnson, St Pauls Church Yard, London.

[redacted]

Deſcription.

Size. When full grown about half an inch in length, and in thickneſs reſembling a fine piece of thread.

The Head, or obtuſe extremity, is nodoſe, and divided into three veſicles or papillæ, in whoſe middle is an aperture, through which the worm takes its nouriſhment.

The Body forms about a third part of the length of the animal, beginning immediately from the head, and terminating in the tail, known by its becoming leſs. It is of a rugoſe, pellucid, annular fabric.

The Tail commences where the body ends, gradually becoming leſs, and terminating (like a cobbler's awl *) in a fine point. When viewed with a glaſs, it appears ſubulated, and furniſhed with rugæ or thick firm annuli, and there is a ſmall aperture at its beginning, through which the fæces are excreted.

Situation.

They are moſt commonly ſituated in the inteſtinum rectum of children, and are continually paſſing *per anum*; hence they are called by the Germans **Afterwurm.** They are frequently met with in the cæcum and colon, and have been found in the ſtomach * and ſmall inteſtines, lying hid between their tunics.

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* Thus it is called by ſome German writers Die Schwanzſpitze,

They not unfrequently creep round from the *anus* to the vulva in women †, and I have known them inhabit the vagina and uterus. Anatomical inveſtigations after death have expoſed them in the bladder and urinary paſſages. *

Number.

This ſpecies is generally in very conſiderable numbers, eſpecially in the rectum of children. When they inhabit other parts, their numbers are leſs conſiderable, yet I have known upwards of an hundred vomited in the courſe of a day from the ſtomach of a young woman.

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* Wolf Obſervat. Chirurg. Medic. l. 2. obſ. 4.

† Hippocrates, in his liber de morbis mulierum, affirms, that the aſcarides are generated *in ſinu pudendi muliebris*, and recommends the ſemen viticis and ox's gall to deſtroy them. His words are, Επὴν γυναικος εν τω αιδοίω ἢ εν τω ἀρχω ἀςκαρίδες γίγνωνται, λύγȣ καρπός μίςγεται, ἢ φύλλα, και βοὸς χολὴ παραμιςγεται οσον οβολος, κεδρινω δε ελαίω φυρῆν, και ἐιρίω πινόεντι ευιρωτάτω αναλαβεῖν.

Colour.

Their natural colour is a pale yellow. They are often obſerved of a yellowiſh green, and occaſionally brown. This would appear to depend upon a variety of circumſtances with which we are unacquainted; for, if ſuffered to remain a day or two in water, they always (whatever their colour may be) become of an opaque pale yellow.

Motion.

The head is the part firſt put into motion, which the animal turns in every direction, ſometimes forming a circle, at other times the figure eight; but moſt frequently its tail appears fixed, whilſt it turns its body ſometimes to one ſide, and then to the other. They are extremely vivacious, and I have ſeen them bury themſelves in the ſoft fæces of children almoſt inſtantaneouſly upon expoſure to the atmoſpheric air. By ſome they are ſaid to jump from one place to another, but I cannot ſay I have ever ſeen them *.

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* This circumſtance appears to have given riſe to the name aſcarides; for αςκαριζειν ſignifies the ſame as σκαριζειν ſaltare, inquiete movere, ſalire.

Sex.

Sex.

The vermicular aſcarides are not, as is the generally received opinion, hermaphrodite. The male and female are diſtinct worms.

The Male, when expoſed to the magnifying power, does not exhibit any of the gyrated apparatus, which, in the female, is decidedly for the purpoſe of bringing the young to perfection. The ſtomach and inteſtinal canal have, apparently, a different arrangement from thoſe of the female, and are the only viſcera I have been able to detect. I have ſearched for the male organs of generation, but have never been fortunate enough to find them. Perhaps they are ſo very minute as to elude our reſearches.

The Female has, upon its external ſurface, about the eighth of an inch from the head, a ſmall punctiform aperture through which the young are protruded. When the worm is very much magnified, its internal cavity appears filled with the convoluted apparatus; and I have ſeen upwards of an hundred of the young eſcape through the external aperture, all alive, and very vivacious, ſeveral hours after the death of the mother, upon making a ſlight preſſure with the finger.

Anatomical Obſervations.

The integuments of this ſpecies are ſimilar to thoſe of the lumbricoid aſcaris, and conſiſt of cuticle, cutis, and, as far as I can diſcover, only one ſet of annular muſcles.

I have never been able to detect any longitudinal lines upon its external ſurface.

The cavity in which the viſcera are ſituated, begins at a very ſmall diſtance from the head, and terminates where the tail commences; at which place there is a ſmall opening, the extremity of the inteſtinal canal.

The only viſcera in the MALE worm are the œſophagus, ſtomach, and inteſtine.

The ŒSOPHAGUS begins at the mouth, gradually enlarges for a ſmall ſpace, and terminates in the ſtomach.

The STOMACH is a ſomewhat round bag, ſituated at the extremity of the œſophagus, ſo that, both together, they are piſtilliform, that is, reſembling an apothecary's glaſs peſtle, which, according to Goeze, conſtitutes a diſtinguiſhing character of this ſpecies *.

The

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* "Dies iſt eine ganz eigene art," ſays Goeze, "und unterſcheidet ſich vou allen ubrigen ſtandhaft durch folgende unveranderliche karaktere:

1. durch

The ſtomach evacuates its contents into the INTESTINAL CANAL, which is continued through the worm, more or leſs contracted or dilated, until it terminates in the anus.

The contents of the ſtomach and inteſtinal tube are always of the ſame colour, a dark brown.

THE FEMALE worm has (beſides the viſcera I have deſcribed) an apparatus ſubſervient to generation. It begins by a ſlender tube leading from the ſmall punctiform opening or pudenda, ſituated nearly in the middle of the body of the worm. It ſoon becomes much larger, embraces the inteſtinal tube in every direction, and fills up the cavity of the worm. This gyrated uterus is not bifurcated as in the aſcaris lumbricoides, nor has it thoſe filiform appendages. Its end or fundus is as large as any other part. When viewed with the microſcope, it appears like a bladder diſtended with worms, for its young are diſtinctly ſeen moving about from one end to the other.

1. durch den, wie eine Morſerteule, geſtalteten Saugkanal und Magen.
2. durch den, wie eine pfrieme oder Schuſteraale, in die feinſte Spike zulaunfenden, Schwanz."

GENUS II.

Species 1.

TRICHURIS VULGARIS.

Latin. Trichuris.
Engliſh. The long Thread-worm.
French. Le ver a queue.
German. Der Schwanzwurm.

SYNONYMS.

Tichuris.	*Wagleri & Roederer de morbo mucoſo, &c.*
Tichuris inteſtinalis.	*Wriſberg de animal. infuſ. p.* 6.
Acaris Trichuria.	*Schroeter, diſſert. Inaug. de vermibus. C. H. p.* 16.
Dr Schwanzwurm.	*Blumenbach, hand. der natur. & Bloch. Abhand. von der Crzeug. der Cingeweidewurmer.*

Eſſential Character.

Body large and furniſhed with a proboſcis. Tail twice as long as the body, and filiform.

Deſcription.

Size. The body, when full grown, equals in breadth the ſixteenth of an inch. In length the whole worm meaſures nearly two inches, two-thirds of which are tail; hence the French call it *le ver a queue*.

The large extremity of the trichuris is the HEAD, out of which proceeds a kind of proboſcis, not always viſible; for the animal has the power of ejecting and drawing within itſelf this inſtrument at pleaſure.

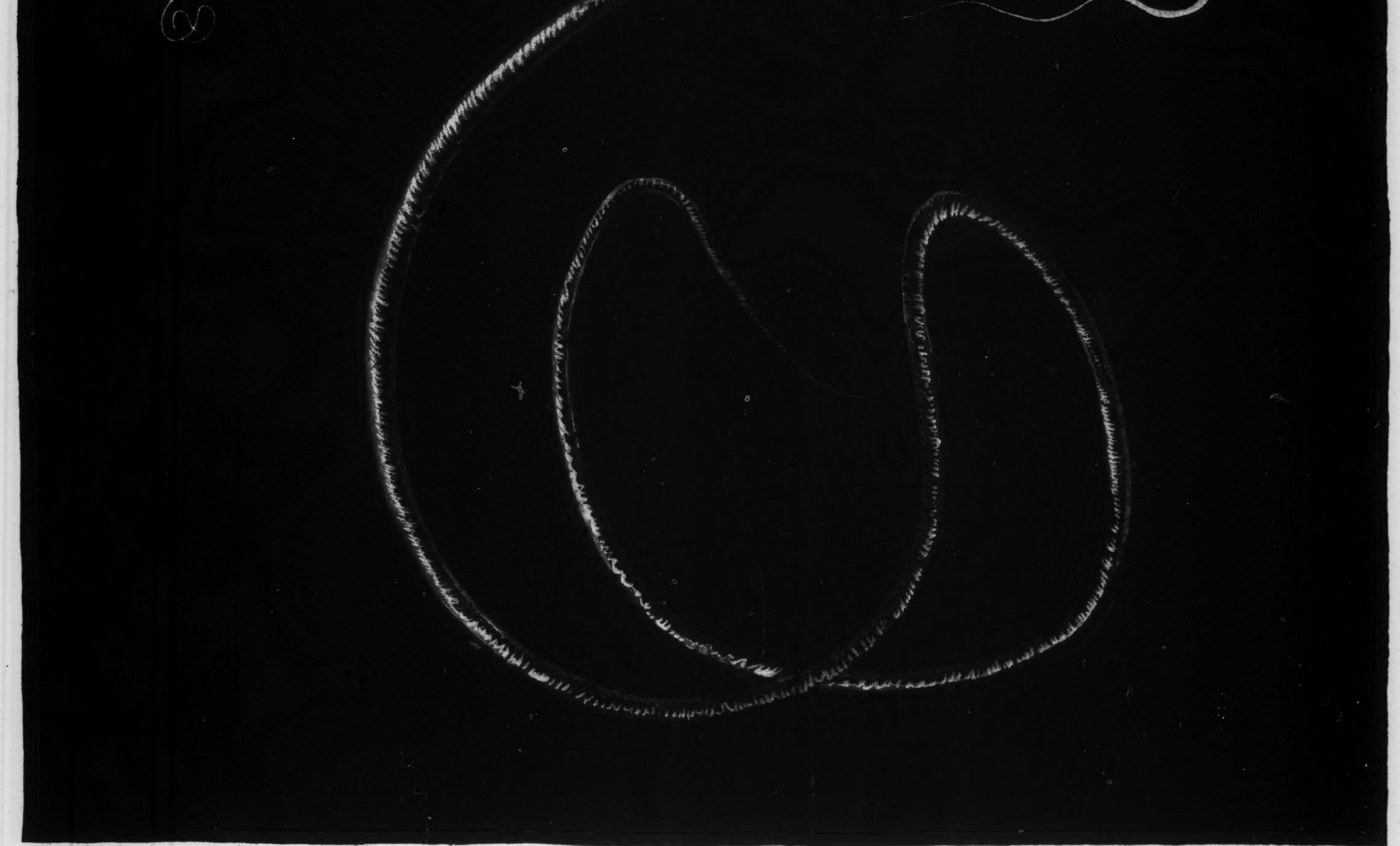
THE BODY may be ſaid to begin at the baſis of the proboſcis; it is the thickeſt part of the worm, and the moſt ſo at the extremity, where the proboſcis is received. It gradually diminiſhes in ſize as it proceeds, and forms about one-third part of its length.

The TAIL commences where the body terminates. It is twice as long as the body, and appears like a fine hair, gradually becoming ſmaller, and at length terminates in a very fine point.

Number.

I have ſeen upwards of twenty in ſome fæces of a child of ſix years old, and, according to the account of Blumenbach, they are, in general, in conſiderable number.

2



H. De Bruyn Delt. T. Medland Aquatinta.

Trichuris

Published Decr. 1. 1798. by J. Johnson, St. Pauls Church Yard, London.

Situation.

Wriſberg, Blumenbach, and others, have found theſe worms in the inteſtinum rectum, in the inferior part of the ileum, and alſo in the jejunum, mixed with their pultaceous contents. I have never ſeen them after death but in the cæcum.

Colour.

Like the vermicular aſcarides.

Motion.

The only worm I have had an opportunity of examining alive, was that from which the drawing annexed was taken. Its motion was by no means vivacious, which would appear to ariſe from a want of power, as the animal died ſoon after. About a minute before its death the proboſcis was withdrawn, and ſuddenly elongated three or four times, when it gradually curled itſelf into the ſhape in which it is repreſented, and was never obſerved to move after.

Sex.

Goeze has given a drawing of a female trichuris, and ſays it has no proboſcis (the proboſcis he ſuppoſes to be the male organ of generation); but, as I have carefully diſſected thoſe which were, apparently, without the proboſcis, and find no material difference in the viſcera, I am inclined, at preſent, to doubt the fact. If the apparatus contorted in a ſerpentine manner be peculiar to the female, and be conſidered as the ovarium, why ſhould it exiſt in a male worm?

Anatomical Obſervations.

This curious and ſingular animal is ſupplied, like the foregoing genus, with annular muſcles, cutis, and cuticle.

The proboſcis, which is undoubtedly the head of the worm [*], appears to be formed of a tranſparent ſubſtance, and contains a canal which is continued through the pulpy or funnel-like portion to the ſtomach and inteſtine.

THE STOMACH AND INTESTINE are formed by a long canal, which proceeds in a direct line from the head to the very extremity of the worm. It is largeſt at its beginning, and continues of the ſame ſize throughout the body of the animal; and when arrived at the place where the tail commences, it ſuddenly becomes conſiderably leſs in diameter, and terminates in the anus.

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[*] Goeze conſiders this proboſcis as the penis, and ſays the other extremity is its head; and in the female drawing he makes the filiform extremity the tail, and the other the head.

The remaining viſcus, or OVARIUM, is a convoluted canal ſimilar to that of the female vermicular aſcaris, but is ſeldom found embracing the inteſtinal tube. The contents of this canal are ovula and a limpid fluid. I have never ſeen any young worms.

ORDER II.

GENUS I.

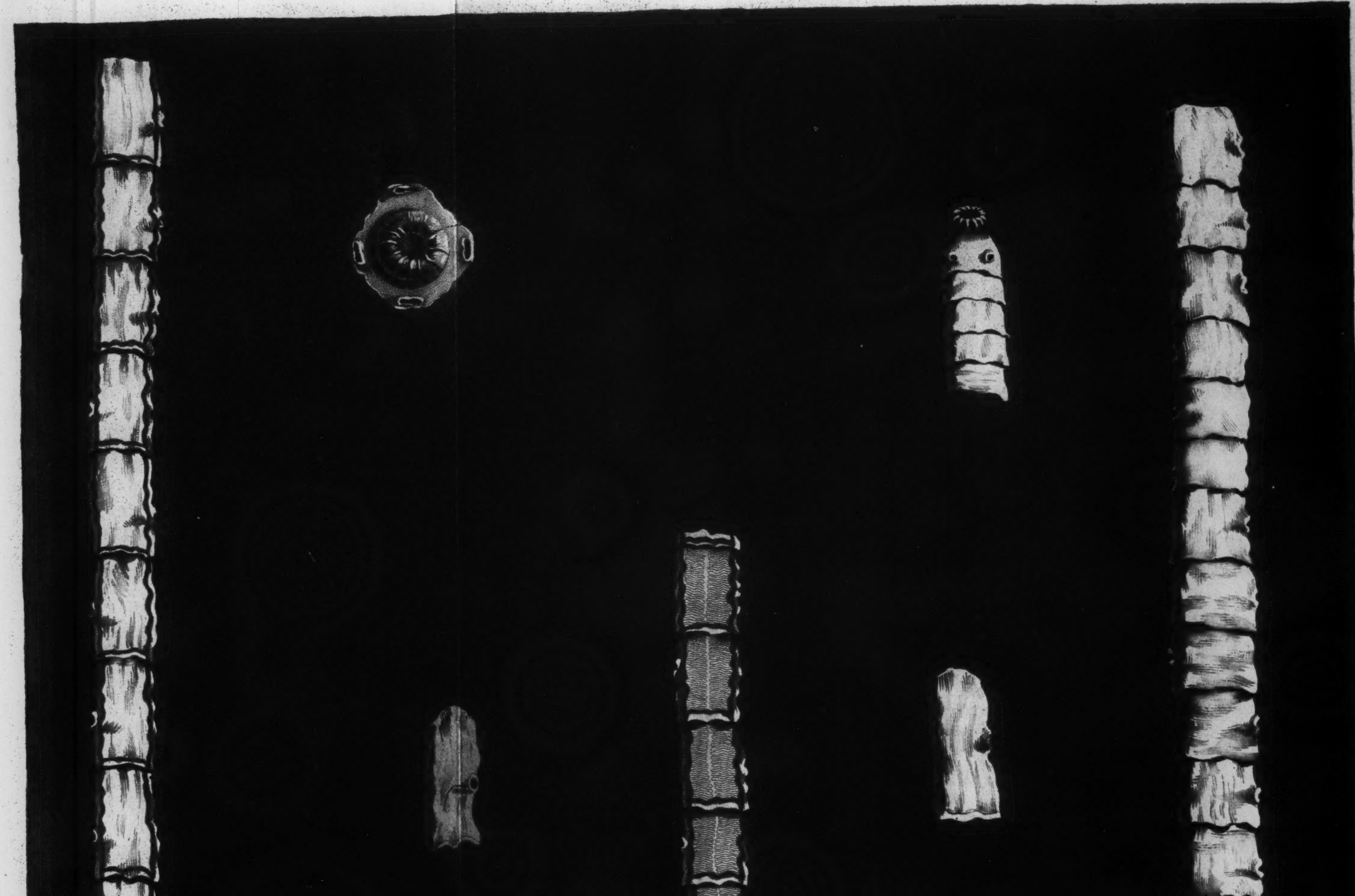
Species 1.

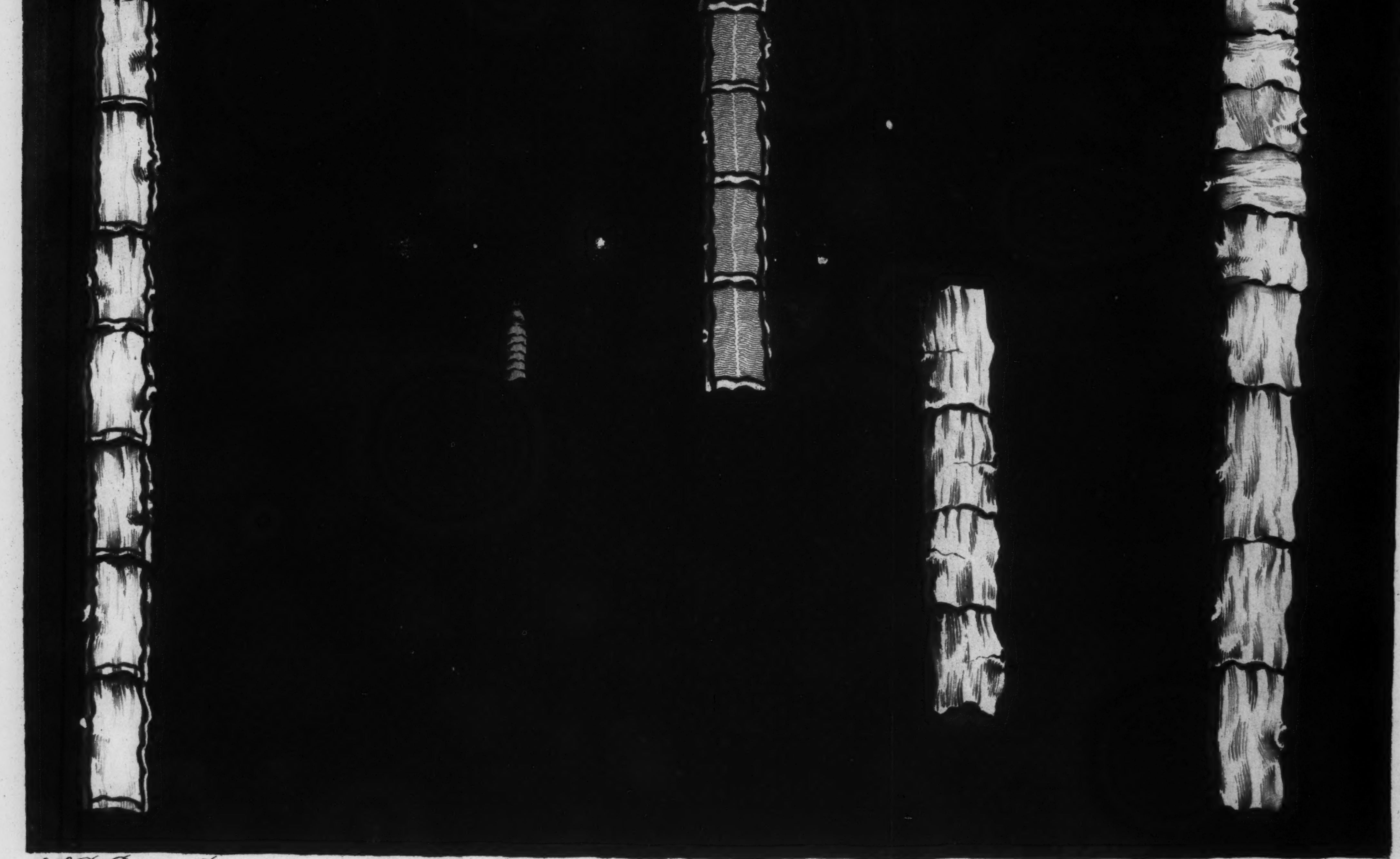
TÆNIA OSCULIS MARGINALIBUS.

Engliſh. The tape or long joint-worm.
Latin. Tænia cucurbitina, Solium.
French. Le ver ſolitaire.
German. Dee Kurbiſwurm.

SYNONYMS.

Vermis cucurbitinus.	*Plateri praxis medica. p.* 992.
Catena de cucurbin.	*Valiſneri opera in folio, p.* 177.
Vermi cucurbitini.	——— *neuve obſervazioni. p.* 174.
Lumbricus latus.	*Tyſon philoſoph. tranſ.*
——— ———	*De Haen ratio medend. p.* 12. *c.* 5. *p.* 210.
Tænia ſolium. ——- ſans èpine. Ver cucurbitaire.	*Andry. gener. des vers. cap.* 3. *art.* 2. *p.* 74.
Tænia cucurbitina.	*Pallas elench. p.* 405.
——— ———	*Vogel de cog. & cur. corp. hum. affect. p.* 146.
Tænia articulos demittens.	*Dionis diſſert. de tænia.*
Tænia ſecunda.	*Le Clerc hiſt. lumb. lat. tab.* i. *a. tab.* ii.
Tænia ſolium.	*Linnæi ſyſt. natur. edit.* 12. *p.* 1323.
Tænia a longues articulations. Tænia anneuxs longues.	*Bonnet. mem. des ſav. etrang. v. p.* 1.





H. De Bruyn Delt.

T. Medland Aquatinta.

Tænia osculis marginalibus.

Published Decr. 1 1798, by J. Johnson, St. Pauls Church Yard, London.

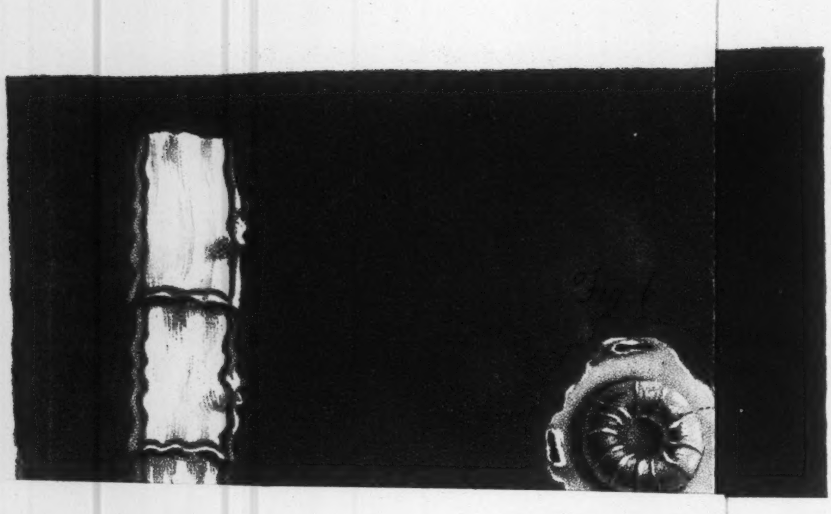


Fig 1

Eſſential Character.

The oſcula are ſituated upon the margin of each articulation, and the ovaria are diſpoſed in an arboreſcent form.

Deſcription.

This animal conſiſts of an head * placed at the ſmalleſt extremity, and a chain of articulations more or leſs broad or long, which gradually enlarge as they advance, and at length terminate in a tail, formed by a rounded joint. Each of theſe joints contain their proper viſcera.

EXTERNAL STRUCTURE OF THE HEAD. When viewed by the naked eye, and lying upon a flat ſurface, three projections preſent themſelves, one anterior, and the other lateral. But if the head be held up, and its extremity viewed attentively, five projections are conſpicuous; one ſituated directly anteriorly and in the middle, and the other four backwards, and laterally.

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* Linnæus ſtrenuouſly denied that the tænia had any ſuch head, as appears from many parts of his writings.

The anterior projection is the proboſcis of the worm. When examined by the aid of glaſſes, it preſents a protuberant margin, ſurrounding an excavation of a ſtriated appearance like a ſtar. In the centre of this is an orifice or mouth leading to a canal, hereafter to be mentioned. The ſtellated appearance, when more minutely examined and enlarged by the magnifying lens, is found to be compoſed of two ſeries of radii, with little bulbs or veſicles correſponding to the number of fibrils, with which the margin is beſet, and which gives it a laciniated appearance. Theſe laciniæ * are by ſome ſaid to be vaginal, including ſuctorial bulbs, whence they have named them " *vaginæ ſugentes.*"

Paſſing backwards we come to the neck of the proboſcis, which, as it advances towards its baſis, becomes flattened and broader. Its baſis is quadrangular, and has an hollow protruding tubercle or oſculum at each angle. It then becomes conſiderably flattened, and forms a thick margin, which receives the ſuperior or adjacent margin of the next joint.

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* Tyſon calls them *ſpiculi hamati*, and they are the *uncinulæ* of Pallas and Loeſke.

THE EXTERNAL STRUCTURE OF THE JOINTS. In this ſpecies of tænia the joints differ very much in the ſame worm. Their figure is by no means characteriſtic. They are, for the moſt part, oval, rhomboidal, oblong, or quadrangular, and generally have a great reſemblance to large cucumber ſeeds; from which circumſtance the detached joints have been named CUCURBITINI. They are ſhorteſt near the head, and their length towards the tail is ſometimes exceeded by their breadth.

When the ſurface of a joint is viewed by a microſcope, directly after it has been wiped with a ſponge, it appears rough and villous, but it ſoon becomes covered with a white tenaceous liquid, which exudes through the pores of the ſkin. If this liquid be again wiped off during the life of the animal, it is quickly renewed. May not the villi be exhaling veſſels? On the margin of each joint, near the middle, is an oſculum, and none on the oppoſite margin of the ſame joint. It ſometimes happens that a joint is furniſhed with more than one oſculum. They have frequently been obſerved with three or four. I have in my poſſeſſion a joint with five oſcula upon one margin. May not this throw ſome light upon the propagation of the joints? But, in general, the next joint has its oſculum ſituated on the margin of the oppoſite ſide, ſo that it alternately changes. This order, however, is ſeldom preſerved throughout the whole tract of the worm, for they are ſometimes on the ſame ſide for ſeveral joints together, but they never are ſituated on the flattened ſurface; hence their being marginal is an eſſential character of this ſpecies.

Anatomical Obſervations.

I have never been able to detect but one membrane in the tænia, which is very porous and elaſtic, and which I am induced to believe, from ſome experiments, is endowed with nervous power. Tæniæ, therefore, have no cuticle.

THE HEAD. The head is compoſed, like the other parts of the worm, of cutis and muſcular fibres. The fibres, however, are not in any regular order, but appear to run in every direction, and are united together by a connecting cellular membrane.

The head contains alſo within it the beginning of the alimentary canal, which originates from the mouth by a ſimple tube or œſophagus, that bifurcates near the baſis of the proboſcis. This bifurcated alimentary tube proceeds from the head near each margin of the worm to the other extremity.

Through this canal the animal conveys the chyle to every part for its growth and increaſe.

INTERNAL STRUCTURE OF THE JOINTS. When the cutis is removed the muſcles of the worm are laid bare. They are of a white colour, very much reſemble the coagulable lymph, and are diſpoſed into two orders, evident to the naked eye.

1. *The longitudinal* or external muſcles, which are of a ſtrong, firm texture, running parallel to each other in the direction of the worm, being firmly attached to a kind of ligamentous band, and placed along the articulatory receiving margin of each joint.

2. *The tranſverſe* muſcles, which are ſituated under the longitudinal, and acroſs the joint tranſverſely from one extremity to the

other. I have never detected any point of adheſion at the margins, and believe them to be annular.

When the *longitudinal* muſcles contract the length of the joint is diminiſhed and drawn forward.

The *tranſverſe* muſcles act by diminiſhing the breadth of the joint, and ſometimes render it almoſt round.

Each articulation, or joint, is furniſhed internally with two diſtinct kinds of veſſels, the alimentary tube and the ovaria.

The reſt of the joint is compoſed of a connecting cellular ſubſtance.

ALIMENTARY TUBE *. I have already deſcribed the beginning of this canal in the ſtructure of the head, at the baſis of which it divaricates into two diſtinct canals, which are continued near the margins from one extremity to the other, and in the extreme joint, where it is impervious. This longitudinal tube is alſo ſupplied with tranſverſe canals. There is always one ſent acroſs each joint along the articulatory receiving margin to the canal on the oppoſite ſide, with which it has a communication, ſo that the contents of one tube are, with great facility, communicated acroſs to the other. As theſe canals are not to be detected except by injecting the worm, it may not be unacceptable to my readers to relate the method I uſually purſue. Having prepared my injection*, and ſoaked the injecting ſyringe, and the portion of the worm, for ſome time, in warm water, I make a longitudinal inciſion with a lancet, near the margin of the joint, and introduce the point of the ſyringe filled with injection, taking care that its head is turned towards the head of the worm, and then make a gentle preſſure on the ſyringe, when the injection will ſoon be obſerved running along the ſides of the worm, and ſeveral yards may be injected by one puſh. When the worm is thus injected, it ſhould be carefully dried and put into oil of turpentine, when the longitudinal and tranſverſe canals will appear very diſtinctly.

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* Le Clerc was the firſt who diſcovered this canal, but he had not the moſt diſtant idea of its uſe.

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* The injection for this purpoſe is prepared in the following manner. Take of fine parchment ſhavings one handful, and boil them in three pints of ſoft water to a pint and a half; and then ſtrain it through a very fine gauze ſieve for uſe. Of this ſize I generally take a ſmall cupful, and mix as much finely levigated Chineſe vermillion, or any other colouring matter, as is ſufficient to give it the deſired ſhade. The ſyringe I uſually employ is, an oyſter ſyringe with a quickſilver tube.

Ovaria. Each individual joint has a vaſcular ſtructure ſituated between the longitudinal canals, occupying the middle of the worm. It is always diſpoſed in an arboreſcent form, and is termed the *arboreſcent ovaria*, from its reſemblance to a tree, being compoſed of a middle canal or trunk, and lateral ramuli. There is a communication between this arrangement of veſſels and the oſculum on the margin, by means of an intermediate canal, which, in ſome joints, is filled with a brown matter. The ovaria are generally filled with an opaque fluid, very like chyle, which is ſaid to contain ovula. In ſome joints, and moſtly thoſe near the tail of the worm (for theſe are generally more tranſparent than the reſt), this circumſtance is evident to the naked eye, eſpecially if the joint be put on blue or black paper.

If ſome of this opaque chyle-like fluid be taken out of theſe canals and expoſed to view in a good microſcope, it is ſaid to exhibit ovula of different ſizes, from the largeſt of which very ſlender tæniæ have been ſeen to eſcape upon rupturing its ovum, contorted in a ſpiral form, and having conſpicuous traces of articulations, and one extremity acuminated, the other obtuſely broad *.

Of the Connexion of the Joints.

The joint next to the head is received into the baſis of the head, and it, in like manner, receives the beginning of the next joint, which order is obſerved throughout the whole extent of the worm. Thus the inferior margin of joint, or that towards the tail, is called the receiving articulatory margin, to diſtinguiſh it from the other which is received. The receiving articulatory margin is ſupplied with a ligamentous band, to which the longitudinal muſcles are attached, which firmly embraces the next joint. This margin may always be known from the other by its being largeſt, and by its being fringed, whereas the other is plain, and ſomewhat rounded.

Of the Separation of the Joints of this Worm into the VERMES CUCURBITINI.

The joints of the tænia oſculis marginalibus are very eaſily ſeparated from each other whilſt the animal is alive. This ſeparation is effected either by the periſtaltic motion of the inteſtines, or, perhaps, ſpontaneouſly. Each joint thus detached from the mother worm, has the power of retaining, for a conſiderable time, its living principle, and is called, from its reſemblance to the ſeed of the gourd, *vermis cucurbitinus.* This phenomenon has given riſe to many warm diſputes; ſeveral authors have denied their being portions of tæniæ, and have affirmed that they were diſtinct worms; but of this hereafter. The ſeparated joints do not appear capable of retaining their ſituation for any length of time, but are ſoon forced down the inteſtinal tube, and at length creep out, or are expelled *per anum.* I knew a man who had been for ſome time troubled with this ſpecies of tænia; whenever he took an eccoprotic medicine, he voided upwards of forty detached joints with his fæces; and, I remember a female patient, who was always tormented by their creeping *per anum* two or three hours after dining, without the exhibition of any medicine. Such eliminations are common to all who nouriſh this worm.

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* Vide Goeze.

Thus it is evident that the joints of this animal exiſt for a time when ſeparated from each other. I have kept them alive, and fed them for two or three days together; but I do not believe that they are capable of living any length of time in the inteſtines, when perfectly detached.

I am inclined to believe that the vermes cucurbitini have not the power of propagating the ſpecies, i. e. of forming freſh joints; I conceive that property to be peculiar to the head; but this is to be conſidered as mere hypotheſis, cheriſhed by the two following circumſtances: 1ſt. That their expulſion always ſucceeds their being detached; and, ſecondly, that the ſeparation of the joints appear to be the only means of inſuring the worm a continuance in its ſphere; for, were the head to continue multiplying the joints, and the joints have the ſame power, they would ſoon obliterate the cavity of the inteſtinal tube, and, conſequently, effect their own expulſion.

Of the Formation of freſh Joints.

There are ſeveral caſes faithfully recorded, and ſeveral have come under my own care, where the perſons, if their veracity can be depended upon (and they had no intereſt in deceiving), have voided, during the time they were troubled with the worm, upwards of fifteen thouſand. I have attended ſeveral patients who were martyrs to the ravages of this animal for upwards of ſeven years, and the number of joints which during that period have been evacuated, are beyond all conception; from ſome, upwards of fifty per day, and ſeldom fewer than twenty.

When a ſpecific is adminiſtered, and the *whole* worm or worms is brought away by ſtool, no more portions are ever known to follow. But experience teaches, that when all is voided except the head, that then in a ſhort time after, freſh joints are generated, and the patient is as much troubled with them as before.

Thus it is evident that the formation of the joints is proper to the head of the animal, and, I believe, to it alone.

Number of this Species of Tænia.

It is not, in general, ſolitary, as is commonly ſuppoſed; Herrenſchwanz, Madam

Nouſer, and others, mention their ſeeing ſeveral come away, at the ſame time, from their patients.

Situation.

They are always found in the *jejunum* and *ileum*, occupying their whole extent.

Colour.

Tæniæ are moſtly of a pale white, but the colour varies in different worms. They are not unfrequently of a light brown caſt, which, in all probability, ariſes from living on the chyme, or on chyle mixed with ſome bile.

Motion.

The motion of tæniæ is undulatory. The firſt joint towards the head contracts, the ſucceeding ones follow ſucceſſively, and the worm is at length drawn conſiderably forwards, exactly in the manner that the earth worm is ſeen to move, but not near ſo rapidly. By this means the food taken in at the mouth of the worm is very ſoon conveyed all along the alimentary canal. I have detected milk mixed with a colouring matter

running

running along this canal in the above manner with conſiderable rapidity.

Sex.

There can be very little doubt of tænia being hermaphrodite. The oſcula are believed to be viſcera, ſubſervient to the propagation of the ſpecies *, and they can be proved to give exit to the ovula.

Length.

Boerhaave mentions his meeting with a tænia thirty ells in length, and Pliny ſays he has ſeen them upwards of thirty feet long. The exact length, however, depends upon the manner in which the death of the animal was occaſioned. If expelled by irritating medicines, it will not be as long by nearly one-half, as if its death had been occaſioned by emollients; for, in the firſt inſtance, it would be very much contracted, but in the latter, very much relaxed.

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* This is the opinion of the ingenious Mr. Carliſle, who ſays, "In a tænia which I obtained before it was dead, I obſerved, at one part where it had formed a knot upon itſelf, that two pairs of theſe oſcula were in contact with each other, and were agglutinated together by a viſcid mucus. I was not at that time aware of the poſſible nature of this connexion, and neglected preſerving them in that ſtate. I now ſuſpect, however, that they were in the act of copulation, and that a mutual influence takes place previouſly to the formation of ova. Vide Tranſactions of the Linnean Society, vol. ii. p. 255.

OBSERVATIONS.

Dionis, in his treatiſe upon tænia *, has called this ſpecies tænia articulos demittens, in conſequence of the frequency of its parting with its joints; and this circumſtance has given riſe to innumerable errors.

The Arabian phyſicians obſerving theſe detached portions come away alive, and not thinking it poſſible they could be joints of another worm, believed they were a diſtinct ſpecies, and deſcribed them accordingly.

Others, finding ſeveral of the joints articulated together, believed it to be in conſequence of ſuction †.

Thoſe who could not conceive how the angles and veſſels could correſpond ſo exactly, ſuppoſed they were all ſurrounded by a common membrane, which Van Helmont

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* Diſſertation ſur le Tænia ou ver plat. p. 14.

† Vide Larthuſer fundam. path. tom. ii. p. 203.

aſſures us has its origin from the inteſtinal mucus.

Linnæus arranges them amongſt the polypi, and many very learned authorities appear to favour his opinion. The following is an extract from one of his letters to Baron de Haller. Tæniam examinavi, et reperi 14 vivas integras, quæſivi caput quod omnes medici in lumbrico lato, quæſiverunt, ſed fruſtra; falſiſſimum eſt caput, quod Tulpius habet in obſervationibus, et fruſtra quæritur caput, nam caput eſt in ſingulo articulo, et os in ſingulo articulo, in una ſpecie ſubtus, in altera ad latus. Nullus mortalium potuerit intelligere hunc vermem, qui non intellixerit polyporum naturam, et propagatur ſecedentibus articulis, dum quilibet articulus vivit et accreſſit in perfectum corpus: inſerui actis Upſalienſibus nunc imprimendis *.

Some believe the lateral oſcula to be the mouths by which they take in their food, and, at the ſame time, conſider them as excretory veſſels. Coulet † and Ernſt are of this opinion; the latter expreſſes himſelf thus: Nihil

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* Vide Linnæus in Collect. Epiſtol. ab erud. viris ad Haller. Tom. 2. p. 411.

† Tractatus Hiſt. de Aſcarid. l. c.

ergo reſtat quam ſtatuere idem orificium abſorptioni chyli et excretioni excrementorum inſervire. Objectio enim quaſi nulla excrementa ejicerent iſti lumbrici, quia merum chylum ederent, nulla eſt; alias infantes puro lacte viventes nihil excrementitii haberent; nec abſurdum putes hoc ben. lect. ſi idem oſculum et deglutitioni et excrementis largior. Stella enim marina unicum in ſuperiori ſuperficie habet orificium quo artificioſe prædam arripit, devorat, et quicquid eſt excrementitii, per idem orificium reddit, nonne idem noſtræ Tæniæ natura diverſimodo ludente privilegium concedi potuit *?

Bonnett appears in one part of his treatiſe on inſects, to favour a ſimilar opinion, although he expreſſes himſelf very differently in other places. Speaking of a ſpecies of tænia he obſerved with two oſcula on the flattened ſurface, he ſays, " Ces petits viſceres analogues a l'eſtomac et eux inteſtines communiquent avec les ſtigmates; et ſi le plus grand de ces ſtigmates fait le fonction de bouche, on preſume aſſez que l'autre s'acquitte de l'anus †."

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* Vide Ernſt. Diſſert. Inaug. de Tænia ſecunda Plateri.

† Vide Bonnett Traitè d'Inſectologie.

The ſame author conſiders them as organs of reſpiration *. The arboreſcent ovaria are, by thoſe who believe the oſcula to be the true mouths which convey nouriſhment to the worm, taken for chylopoëtic veſſels, and their ovula for ſmall glands † or pieces of fat, or young polypi ‡.

The four ſuckers at the head, Andry aſſures us, are their eyes § ; and Mery is willing we ſhould conſider them as the animal's noſtrils ||. The obtuſe extremity has been taken for the head, and the true head for the tail **.

It is ſomewhat ſingular that ſo many accurate obſervers in ſeveral nations have, during many centuries, pretended that there never was but one of theſe tæniæ in the ſame individual, from whence aroſe the name of SOLIUM, and by the French *Le ver ſolitaire*.

It appears to me ſuperfluous to prove the

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[*] Vide Bonnett, l. c.

[†] Vide Syſtem. Natur. Linnæi, tom. i. p. 1323.

[‡] Vide tom. iv. des Memoires des Curieux de la Nature a Berlin, p. 218.

[§] Andry ſur la Generation des ver. loc. cit.

[||] The ſame book.

[**] Le Clerc Hiſtor. Lumbric. lator. p. 165.

fallacy of theſe and various other ridiculous opinions, and to refute them; for having, I truſt, ſatisfactorily demonſtrated, that they have heads, and the head an apparatus by means of which it abſorbs the nouriſhment, which paſſes from thence to every articulation of the worm; that the oſcula, and the various ramifications which are obſerved in the internal part of the joints, are ſubſervient to generation, and that ovula paſs from thence into the inteſtinal canal; and as it is ſufficiently proved that theſe tæniæ, as well as other worms of our inteſtines, exiſt only in the human body, and that in ſociety, I think all further refutation needleſs.

Species 2.

TÆNIA OSCULIS SUPERFICIALIBUS.

Engliſh. The broad tape worm.
German. Der Breite Bandewurm.
Latin. Tænia lata.
French. Le tænia large de l'homme.

SYNONYMS.

Tænia prima. *Plateri prax. medic. c.* 14.
Lumbricus latus ſeu Tænia inteſtinorum. *Plateri edit. ult. tom.* iii. *p.* 816.

Tænia. Solium a epine.	*Andry generation des vers. c.* 3. *art.* 2. *p.* 73.
Tænia articulos non demittens.	*Dionis diſſert. de tænia.*
Tænia prima Plateri.	*Le Clerc hiſt. lumb. lat. tab.* 5. *fig.* 1. *tab.* 6. *fig.* 2. *tab.* 7. *fig.* 1. & *tab.* 8. *fig.* 1. 2. & 4.
Tænia lata.	*Linnæi Syſtem. natur. edit.* 12. *p.* 1323-4. *Pallas Elench. Zooph. p.* 450. ——— *Diſſert. de inf. viv. p.* 35.
Tænia oſculis lateralibus ſolitariis.	*Linnæi Syſt. natur. edit. prim. n.* 3. *p.* 324.
——————— geminis.	*Linnæi Amæn. Acad. t.* 2. *p.* 78. *tab.* i. *fig.* 2.
Tænia vulgaris.	*Linnæi Syſtem. natur. edit. ult.*
Tænia a anneaux courts. ——— articulations courts.	*Bonnett Memoires des Scavant. Etranger. vol.* i. *p.* 478.
Tænia acephala. Tænia capitata.	*Vogel de cog. & cur. corp. hum. affect.* 1772. *p.* 645-6.
Der Breite Bandewurm.	*Mulleri Syſtem. Linnæi, vol.* vi. *p.* 707.

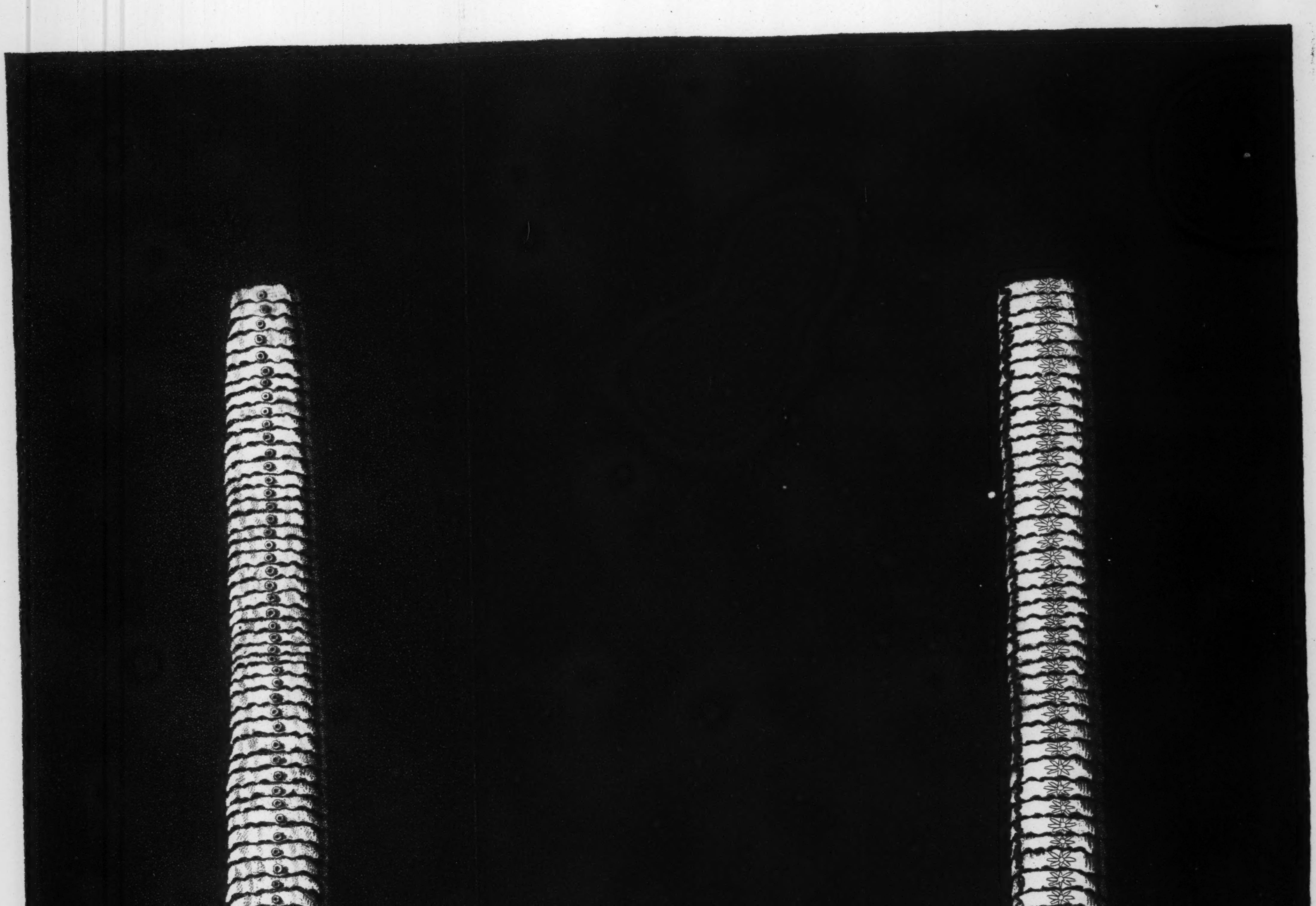
Eſſential Character.

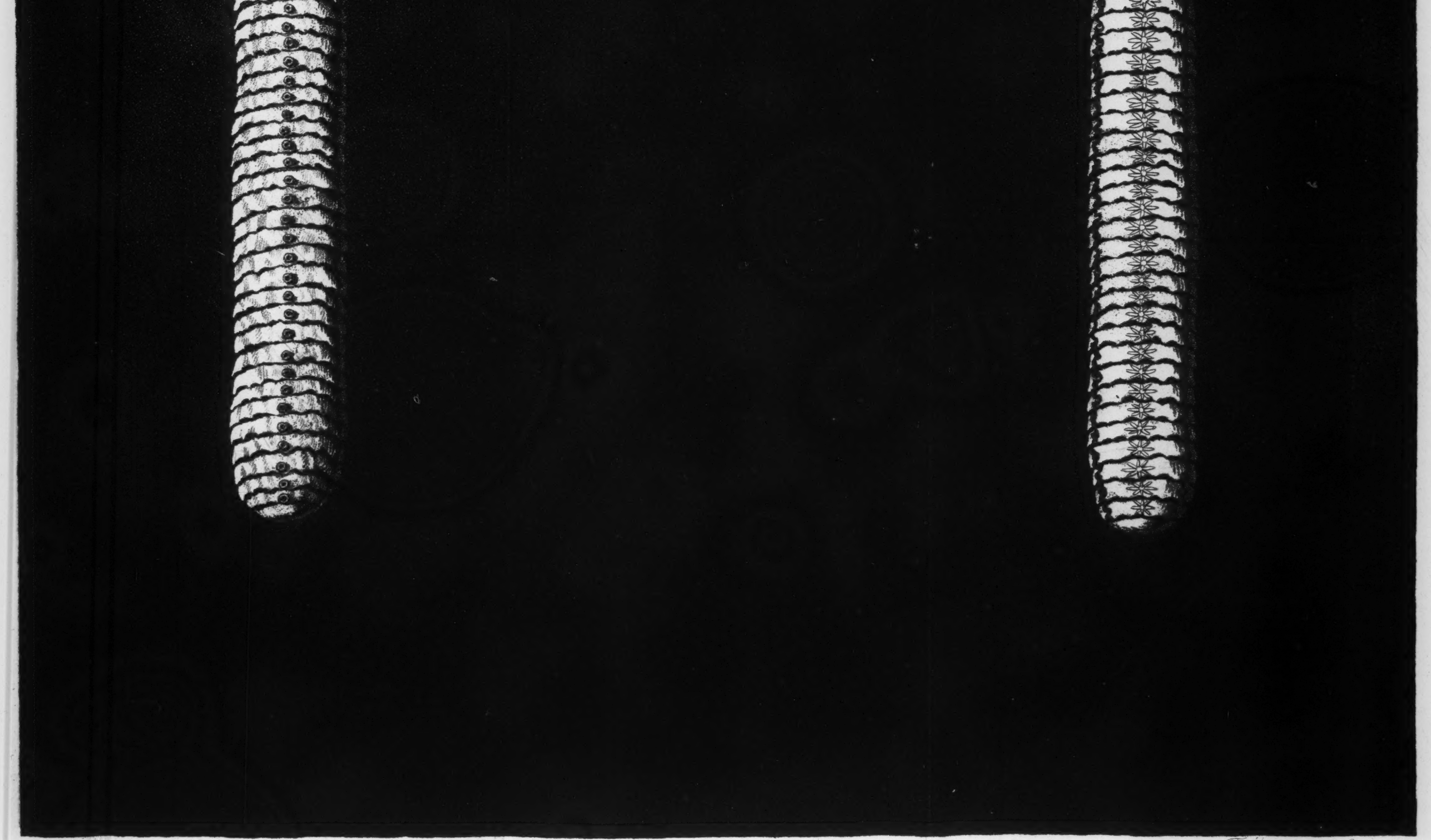
The oſcula ſituated on the flattened ſurface of each joint. Ovaria diſpoſed like a ſtar round the oſculum.

Deſcription.

It is compoſed of a head, a chain of articulations, and a tail formed of a round joint.

THE





H. De Bruyn Delt.
T. Medland Aqua-tinta.

Tænia osculis superficialibus.

Published Decr. 1. 1798. by J. Johnson. St. Pauls Church Yard. London.

[redacted]

THE HEAD is ſimilar to that of the other ſpecies.

THE JOINTS are more uniform in their appearance than thoſe of the tænia oſculis marginalibus. They are conſiderably more broad than long, and their oſcula are not placed on the margin, but in the middle of the flattened ſurface, and only on one ſide. I have never ſeen them change their ſide, but have always obſerved them on the ſame ſide throughout the whole extent of the worm.

In every other reſpect the deſcription of this ſpecies agrees with that which I have given of the other, except that the ovaria are in the form of a roſe or ſtar, hence they are called by ſome writers *Ovaria roſacea*, and others *Stigmates roſacèes*; and that the tranſverſe canals by which there is in the other ſpecies a communication between the longitudinal canals, are in this wanting.

Separation of the Joints.

In regard to the ſeparation of the joints, it is to be remembered, that this ſpecies ſeldom or ever parts with any; and when it does, it happens from ſome increaſed periſtaltic motion of the inteſtines (and not ſpontaneouſly) by which a portion is torn aſunder, and paſſes off with the fæces: thus Dionis has called it Tænia articulos non demittens. This, however, is no characteriſtic of its ſpecies, for when the worm is come away, how are we to know whether it ever ſent off any joints?

Number of this Species of Worm.

Uncertain. Seldom more than three or four; but this number is by no means unfrequent.

Length.

This ſpecies of tænia ſeldom exceeds five yards in length.

Situation.

It is always ſituated in the ſmall inteſtines, and it would appear that it feeds on no other food than pure chyle.

Colour.

It is for the moſt part of a darker hue than the former ſpecies, nevertheleſs I have ſeen it as white as milk.

Motion and Sex.

Like thoſe of the other ſpecies.

OBSERVATIONS.

This ſpecies of tænia is very ſeldom met with in this country, but is endemic in Switzerland and Ruſſia *, and very common in Germany and other parts of Europe.

It is no uncommon circumſtance in the countries where this ſpecies is endemial, to have it come away before it has arrived at its full growth, and this occurring ſo frequently, has given riſe to the name of TÆNIA TENELLA, which is by many conſidered as a diſtinct ſpecies, though, in reality, no other than the worm we have juſt deſcribed, differing from it in ſize only, having every thing elſe in common with it.

Linnæus enumerates another ſpecies of tænia, which he ſays has two oſcula on each joint, one placed upon each ſide, and which he terms TÆNIA VULGARIS. This, which at moſt can only be a variety, is called by

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* Vide Cartheuſer libellus de morbis endemiis.

Pallas Le Gris, who ſays it is of a white colour, and that eaſily changed into a griſeous one by ſpirit of wine. As I have never had an opportunity of obſerving this worm, I paſs it by—probably it is only met with in Switzerland.

EXPLANATION OF THE PLATES.

ASCARIS LUMBRICOIDES.

Fig. 1, repreſents the worm as it appears when recently voided from the bowels.

a. The head.
b. The tail.
c. The depreſſed band.
d. The punctiform aperture.
e. The line extending from the head to the tail.
f. The gyrated apparatus as it appears through the ſkin of the worm.

Fig. 2, repreſents the viſcera of the worm in their natural ſituation; the ſides of the ſkin being fixed down by pin-heads.

a. The head.
b. The œſophagus.
c. The inteſtinal canal.
d. The lines of the body of the worm.
e. The uterus and its convoluted appendices.

Fig. 3, repreſents the uterus, its bifurcation, and its appendices, as they appear when unravelled.

Fig. 4, repreſents a portion of the worm, as it ſometimes eſcapes from the bowels: part of the convoluted apparatus protruding through the parietes of the abdomen.

Fig. 5, repreſents the head enlarged by the microſcope, in which the three veſicles, and the triangular mouth, are ſeen very diſtinctly.

Fig. 6, repreſents the anus and termination of the perpendicular line.

ASCARIS VERMICULARIS.

Fig. 1, exhibits the worm in its natural ſize.

Fig. 2, repreſents a very frequent appearance of this worm when viewed by the microſcope.

a. The head.
b. The tail.
c. The piſtilliform ſtomach.

d. A convoluted apparatus that ſurrounds the inteſtinal canal, which is here and there very obvious.
e. Moſt probably the anus.
f. The external part of the organs of generation.

Fig. 3, exhibits another appearance of the vermicular aſcaris, when enlarged by the microſcope.

a. A bladder-like appearance about the head.
b. The external part of the organs of generation through which an immenſe number of ova and young worms have been obſerved to eſcape.

TRICHURIS VULGARIS.

Fig. 1 and 2, repreſent the natural ſize of this worm, which is ſometimes convoluted and ſometimes ſtraight.

Fig. 3, exhibits the worm as it appeared through the microſcope.

a a. The head.
c. The proboſcis.
d d. The inteſtinal canal.
b. The tail.
\ A hollow tube.
× The ovaria.

TÆNIA OSCULIS MARGINALIBUS.

Fig. 1, a portion of the worm of its natural ſize and uſual appearance.

a a. The marginal oſcula.

Fig. 2, a portion of the worm injected, to ſhew the inteſtinal canal.

Fig. 3, exhibits the arboreſcent ovaria, as they appear between the inteſtinal canal, when injected with their natural fluid or quickſilver.

Fig. 4, the head of its natural ſize.

Fig. 5, the head enlarged by the microſcope.

Fig. 6, a full view of the head, as it appears when very much magnified.

a. The oſcula at the baſis.
b. The protuberant margin, and ſtellated appearance.
c. The mouth.

Fig. 7, a detached joint of the uſual ſize.

a. The extremity which is received.
b. The extremity which is ſupplied with the ligamentous band to receive the next joint.

Fig. 8, exhibits a full view of an oſculum, from which a dark line is ſeen running inwards; this is ſometimes a frequent occurrence, and is often obſerved in many joints, as in fig. 9; it is a canal, diſtended with a dark pulpy ſubſtance, but has no communication, that can be detected, with the inteſtinal canal or ovaria.

TÆNIA OSCULIS SUPERFICIALIBUS.

Fig. 1, exhibits the largeſt and moſt extreme portion of this worm with its ſuperficial oſcula. The head is ſimilar to that of the tænia oſculis marginalibus, with this difference only, that it is much more filiform.

Fig. 2, repreſents a portion of the worm with the inteſtinal canal and ovaria as they appear when injected.

N.° B. The tail is here delineated as terminating in a rounded joint, which is the moſt common mode of termination; nevertheleſs, it is ſometimes ſeen terminating by a bifurcated apparatus, and each fork has been obſerved, ſince theſe drawings were engraved, to have four or five tentacula.

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THE END.